IS 4719 (1984): Wire-woven Rayon Fabric for Aerospace Purposes [TXD 13: Textile Materials for Aerospace Purposes]

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Indian Standard

SPECIFICATION FOR WIRE-WOVEN RAYON FABRIC FOR AEROSPACE PURPOSES

(Second Revision)

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INDIAN STANDARDS INSTITUTION
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Indian Standard

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(Second Revision)

Textile Materials for Aerospace Purposes Sectional Committee, TDC 27

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0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 10 February 1984, after the draft finalized by the Textile Materials for Aerospace Purposes Sectional Committee had been approved by the Textile Division Council.

0.2 This standard was first published in 1968 and subsequently revised in 1979. It has now been revised again to make it up-to-date in the light of the experience gained since its first revision.

0.3 In this revision, a method for determination of the coefficient of radar reflection of the fabric, based on the information received from the Chief Inspectorate of Textiles & Clothing (Ministry of Defence), Kanpur, has been added.

0.4 In the preparation of this standard, considerable assistance has been derived from ADRDE/18 NIV 'Cloth, wire woven', issued by the Aerial Delivery Research & Development Establishment (Ministry of Defence), Agra.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard covers wire-woven rayon fabric used mainly for radar responsive target sleeves.

*Rules for rounding off numerical values (*revised*).

2. MATERIALS

2.1 The viscose yarn used for warp should be of 7·2 tex and for weft of 14·4 tex. Identification of the viscose yarn shall be done in accordance with IS : 667-1981*.

2.2 The soft copper wire to be interwoven in the cloth should be of 0·125 mm diameter and 99·5 percent purity. The purity of the wire shall be determined by the method given in IS : 440-1964†.

3. MANUFACTURE

3.1 The fabric shall be plain-woven with 2 copper wires running together in both warp and weft at equal intervals, the number of wires per metre being as specified in Table 1. The wires should be straight and should not cause distortion in the fabric.

4. REQUIREMENTS

4.1 The fabric shall meet the requirements given in Table 1.

TABLE 1 REQUIREMENTS OF WIRE-WOVEN RAYON FABRIC FOR AEROSPACE PURPOSES

(*Clauses* 3.1 *and* 4.1)

Sl No.	Characteristic	Requirement	Method of Test
(1)	(2)	(3)	(4)
i)	Length/roll, m	40, unless specified otherwise in the contract or order	IS : 1954-1969*
ii)	Width, cm	92 ± 1·5, unless specified otherwise in the contract or order	
iii)	Mass, g/m²	145 ± 10	IS : 1964-1970†
iv)	Number of squares formed by copper wires/dm:		IS : 1963-1981‡
	a) Horizontally	18 ± 1	
	b) Vertically	18 ± 1	
v)	Rayon ends in each square formed by copper wires	19 ± 1	
vi)	Rayon picks in each square formed by copper wires	15 ± 1	
vii)	Number of copper wires/m:		
	a) Warpway	380 ± 5	
	b) Weftway	380 ± 5	
viii)	Skipping	1 end after every 6 ends in addition to 4 ends on either side of copper wires	—
ix)	Coefficient of radar reflection, *Min*:		Appendix A
	a) S-band	0·8	
	b) X-band	0·8	

*Methods for determination of length and width of fabrics (*first revision*).

†Methods for determination of weight per square metre and weight per linear metre of fabrics (*first revision*).

‡Methods for determination of threads per unit length in woven fabrics (*second revision*).

*Methods for identification of textile fibres (*first revision*).

†Methods of chemical analysis of copper (*revised*).

4.2 In respect of requirements not specified in this standard, the radar fabric shall not be inferior to the sealed sample agreed to in the contract or order.

5. PACKING

5.1 The fabric, in continuous lengths and free from creases, shall be rolled on poles longer than the fabric width.

5.2 Each roll shall be tied with 3-ply jute twine (*see* IS : 1912-1975*) and wrapped in single layer of low density polyethylene film (*see* IS : 2508-1977†). Ten such rolls, tied with a cord, shall be wrapped in heavy cee jute cloth (*see* IS : 3751-1966‡) to form a bale. The bale shall be securely sewn with double jute twine with 12 stitches/dm and shall be provided with 12-cm ear at each corner.

6. MARKING

6.1 Each roll shall be marked with the following:

a) Name of the material;
b) Length (m) and width (mm);
c) Year of manufacture, on both ends of the fabric roll; and
d) Name or trade-mark of the manufacturer, at 10-m intervals on both the selvedges.

6.1.1 Each roll may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors may be obtained from the Indian Standards Institution.

6.2 Each bale shall be marked with the consignment details as provided in the contract or order in addition to the markings given in **6.1**.

7. SAMPLING

7.1 Sampling, inspection and testing scheme shall be as detailed in the contract or order. For selecting suitable single, double or multiple sampling plans, IS : 2500 (Part 1)-1973§ may be referred to.

*Specification for country jute twine (*first revision*).
†Specification for low density polyethylene films (*first revision*).
‡Specification for heavy cee cloth.
§Sampling inspection tables : Part 1 Inspection by attributes and by count of defects (*first revision*).

APPENDIX A

(Table 1)

DETERMINATION OF COEFFICIENT OF RADAR REFLECTION

A-1. TEST SPECIMEN

A-1.1 Cut a square piece of the wire-woven rayon fabric of size 660 × 660 mm and fix it to a wooden frame as shown in Fig. 1.

A-2. PROCEDURE

A-2.1 Mount a Duralumin sheet on a stand facing a transmitter and a voltmeter as shown in Fig. 1.

A-2.2 Adjust the power level with the help of a signal generator output control to read a convenient reading on the voltmeter, say 100 mV, by subjecting the mW energy on the Duralumin sheet used as a reference plane of reflection that is 100 percent in the set-up, which is the incident voltage.

A-2.3 Replace the Duralumin sheet by the fabric under test and record the voltage, which is the reflected voltage.

A-3. CALCULATION AND REPORTING

A-3.1 Calculate as follows the coefficient of radar reflection on both S- and X- band frequencies separately and report as coefficient of radar reflection at that frequency:

$$\text{Coefficiency of radar reflection} = \frac{\text{reflected voltage}}{\text{incident voltage}} \times 100$$

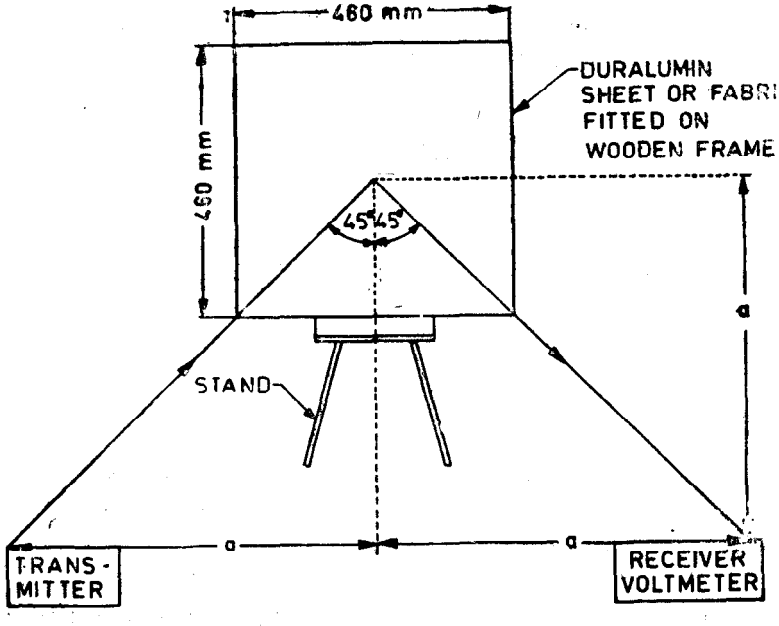

FIG. 1 MEASUREMENT OF RADAR REFLECTION OF WIRE-WOVEN RAYON FABRIC